

2011 American Geophysical Union Fall Meeting

San Francisco, California

December 5-9, 2011

SM03: Dynamic Agents of Magnetosphere-Ionosphere Coupling

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VISIONS sounding rocket mission (VISualizing Ion Outflow via Neutral atom imaging during a Substorm) has been awarded to NASA/GSFC (PI Rowland) in order to provide the first combined remote sensing and in situ measurements of the regions where ion acceleration to above 5 eV is occurring, and of the sources of free energy and acceleration mechanisms that accelerate the ions. The key science question of VISIONS is how, when, and where, are ions accelerated to escape velocities in the auroral zone below 1000 km, following substorm onset? Sources of free energy that power this ion acceleration process include (but not limited) electron precipitation, field-aligned currents, velocity shears, and Alfvénic Poynting flux. The combine effect of all these processes on ionospheric ion outflows will be investigated in a framework of the kinetic model that has been developed by Khazanov et al. in order to study the polar wind transport in the presence of photoelectrons.